

## WHAT IS CLAIMED IS:

1. A method of making ready for presentation a graphical element in a computer application program by communicating with a computer operating system, the method comprising:

executing a first procedure for measuring the element;

executing a second procedure for arranging the element; and

wherein the second procedure is invoked and executed independently from the first procedure.

2. The method of claim 1, wherein the first procedure returns a desired size for the element.

3. The method of claim 2, wherein the first procedure computes desired sizes for child-elements of the element.

4. The method of claim 2, wherein the first procedure comprises determining whether a child-element requires computation of its desired size.

5. The method of claim 1, wherein the second procedure computes a final size for the element.

6. The method of claim 5, wherein the second procedure further computes display positions for a child-element of the element.

7. The method of claim 1, further comprising signaling the element's need to be measured by the first procedure.

8. The method of claim 7, wherein the signaling step comprises calling a measure invalidation function.

9. The method of claim 8, wherein the signaling step further comprises setting a flag on the element.

10. The method of claim 7, wherein the signaling step comprises notifying the operating system.

11. The method of claim 7, wherein the signaling step comprises notifying the element's parent-element.

12. The method of claim 7, wherein the element requests the measuring of all elements needing to be measured.

13. The method of claim 1, further comprising signaling with a signal an element's need to be arranged by the second procedure.

14. The method of claim 13, wherein the signal comprises calling an arrange invalidation function.

15. The method of claim 14, wherein the signaling step further comprises setting a flag on the element.

16. The method of claim 13, wherein the element requests the arranging of all elements needing to be arranged.

17. A set of executable procedures callable by a computer application program for making ready for presentation a graphical element, including at least:

a first procedure for measuring the element;  
a second procedure for arranging the element; and  
wherein the second procedure is called and executed independently from the first procedure.

18. The set of procedures of claim 17 wherein the first procedure returns a desired size for the element.

19. The set of procedures of claim 17 wherein the second procedure computes a final size for the element.

20. The set of procedures of claim 17 further including at least a procedure for signaling the element's need to be measured.

21. The set of procedures of claim 17 further including at least a procedure for signaling the element's need to be arranged.

22. The set of procedures of claim 17 further including at least a procedure for signaling to a parent element the child element's need to be measured.

23. The set of procedures of claim 17 further including at least a procedure for requesting the measurement of all elements needing to be measured.

24. The set of procedures of claim 17 further including at least a procedure for requesting the arrangement of all elements needing to be arranged.

25. A data structure for facilitating making ready for presentation a graphical element, the data structure comprising:

- a first value representing the desired size of the element;
- a second value representing the computed size of the element;
- a first flag for triggering measurement of the element; and
- a second flag for triggering arrangement of the element.

26. A system for making ready for presentation a graphical element, the system comprising:

- a data structure representing the element;
- a first executable procedure using the data structure for measuring the element; and
- a second executable procedure using the data structure for arranging the element.

27. The system of claim 26 wherein the data structure comprises:

- a first value representing the desired size of the element;
- a second value representing the computed size of the element;
- a first flag for triggering measurement of the element; and
- a second flag for triggering arrangement of the element.

28. The system of claim 26 wherein the first executable procedure returns a desired size for the element.

29. The system of claim 28 wherein the first executable procedure computes desired sizes of child-elements of the element.

30. The system of claim 26 wherein the second executable procedure computes a final size for the element.

31. The system of claim 30 wherein the second executable procedure further computes display positions for a child-element of the element.

32. The system of claim 27 further comprising an executable procedure using the first flag for signaling the element's need to be measured by the first executable procedure.

33. The system of claim 28 further comprising an executable procedure using the second flag for signaling the element's need to be arranged by the second executable procedure.

34. A computer-readable medium including computer-executable instructions facilitating making ready for presentation a graphical element in a system, computer-executable instructions executing the steps of:

calling a measuring procedure to measure the element;

calling an arranging procedure to arrange the element; and

wherein the measuring procedure is called and executed independently from the arranging procedure.

35. The computer-readable medium of claim 34, wherein the measuring procedure returns a desired size for the element.

36. The computer-readable medium of claim 35, wherein the measuring procedure computes desired sizes for child-elements of the element.

37. The computer-readable medium of claim 35, wherein the measuring procedure comprises determining whether a child-element requires computation of its desired size.

38. The computer-readable medium of claim 34, wherein the arranging procedure computes a final size for the element.

39. The computer-readable medium of claim 38, wherein the arranging procedure further computes display positions for a child-element of the element.

40. A method for measuring for presentation a graphical element in a computer application program, the method comprising:

receiving an available size parameter for the element; and

causing a measuring function to provide a desired size result parameter for the element, using the available size parameter.

41. A method for arranging for presentation a graphical element in a computer application program, the method comprising:

receiving a final size parameter for the element; and

causing an arranging function to provide a computed size parameter for the element, using the final size parameter.

42. A method for notifying that a first graphical element requires measurement for presentation in a computer application program, the method comprising:

receiving the first element as a child parameter; and

causing a notification function to notify a second graphical element of the first element's need to be measured, using the child parameter.